

What is claimed is:

1. A tire cavity resonance restricting device to be mounted on an inner surface of a tread portion facing to a cavity of a pneumatic tire, comprising;

a cross-sectional area changing member for changing a cross-sectional area of the cavity in tire meridian cross section; and

an elastic fixing member in a form of a ring for fixing the cross-sectional area changing member to the inner surface of the tread portion, the elastic fixing member having an attachment portion to which the cross-sectional area changing member is attached and a non-attachment portion to which the cross-sectional area changing member is not attached,

wherein the non-attachment portion of the elastic fixing member is greater in mass than the attachment portion thereof.

2. A tire cavity resonance restricting device according to claim 1, wherein the non-attachment portion of the elastic fixing member is greater in thickness than the attachment portion thereof.

3. A tire cavity resonance restricting device according to claim 1 or 2, wherein the non-attachment portion of the elastic fixing member is greater in width than the attachment portion thereof.

4. A tire cavity resonance restricting device according to claim 1, 2 or 3, wherein the attachment portion of the elastic fixing member has holes formed therein.

5. A tire cavity resonance restricting device to be mounted on an inner surface of a tread portion facing to a cavity of a pneumatic tire, comprising;

a cross-sectional area changing member for changing a cross-sectional area of the cavity in tire meridian cross section; and

an elastic fixing member in a form of a ring for fixing the cross-sectional area changing member to the inner surface of the tread portion,

wherein the cross-sectional area changing member attached to the elastic fixing member has holes formed therein.

6. A tire cavity resonance restricting device according to claim 5, wherein the holes have openings facing to the cavity.

7. A tire cavity resonance restricting device to be mounted on an inner surface of a tread portion facing to a cavity of a pneumatic tire, comprising;

a cross-sectional area changing member for changing a cross-sectional area of the cavity in tire meridian cross section; and

an elastic fixing member in a form of a ring for fixing the cross-sectional area changing member to the inner surface of the tread portion, the elastic fixing member having an attachment portion to which the cross-sectional area changing member is attached and a non-attachment portion to which the cross-sectional area changing member is not attached,

wherein a mass adjusting element is provided on the non-attachment portion.

8. A tire cavity resonance restricting device according to claim 7, wherein the mass adjusting element is formed from an element having a density that is five time greater or more than an apparent density of the cross-sectional area changing member.

9. A tire cavity resonance restricting device according to any one of claims 1 to 8, having regions formed when the tire cavity resonance restricting device is equally sectioned into thirty-six regions at given positions around a circumference of the elastic fixing member in the form of a ring along a

direction of the circumference, the regions including one region having a maximum mass M_a and one region having a minimum mass M_b , a mass ratio M_a/M_b being one to ten.

10. A tire cavity resonance restricting device according to any one of claims 1 to 9, wherein the elastic fixing member is formed from a belt-shaped band made of metal or resin.

11. A tire cavity resonance restricting device to be mounted on an inner surface of a tread portion facing to a cavity of a pneumatic tire, having an annular cross-sectional area changing member that is arranged so as to be able to change a cross-sectional area of the cavity in tire meridian cross section, the device having regions formed when the tire cavity resonance restricting device is equally sectioned into thirty-six regions at given positions around a circumference thereof along a direction of the circumference, the regions including one region having a maximum mass M_a and one region having a minimum mass M_b , a mass ratio M_a/M_b being one to ten.

12. A tire cavity resonance restricting device according to any one of claims 1 to 11, wherein the cross-sectional area changing member is formed of a sponge.

13. A pneumatic tire having a tire cavity resonance restricting device according to any one of claims 1 to 12.